

WHAT IS CLAIMED IS:

1. A separator for a fuel cell which functions as a separating wall between unit cells constituting a fuel cell stack and has a plurality of apertures forming channels for feeding a fuel, oxidizer or coolant in the direction of stacking the fuel cells, comprising

a feeding manifold communicated with any of the plurality of apertures, and

a plurality of channels communicated with the feeding manifold and extending in substantially parallel.

2. The separator for a fuel cell as claimed in Claim 1 wherein the feeding manifold is formed over the whole surface of the end of the channels.

3. The separator for a fuel cell as claimed in Claim 1, comprising a cover plate covering the upper surface of the feeding manifold such that a distance between the bottoms of the cover plate and of the feeding manifold is substantially equal to the depth of the channels.

4. A separator for a fuel cell which functions as a separating wall between unit cells constituting a fuel cell stack and has a plurality of apertures forming channels for feeding a fuel, oxidizer or coolant in the direction of stacking the fuel cells, comprising

a feeding manifold communicated with any of the plurality of apertures;

a plurality of channels communicated with the feeding manifold and extending in substantially parallel; and

a discharge manifold communicated with any of the apertures not communicated with the feeding manifold and with the channels.

5. The separator for a fuel cell as claimed in Claim 4, comprising cover plates covering the upper surfaces of the feeding and the discharge manifolds, where the cover plates are made of different materials for the feeding and the discharge manifolds.

6. The separator for a fuel cell as claimed in Claim 1, comprising a sealer covering the surface of the separator.

7. The separator for a fuel cell as claimed in Claim 1, wherein the feeding manifold comprises a channel-resistance regulating member.

8. A fuel cell wherein a plurality of cells for a fuel cell comprising electrodes and an electrolyte sandwiched between the electrodes are stacked via the separator for a fuel cell as claimed in Claim 1.

9. The fuel cell as claimed in Claim 8, wherein

the channels in the separator for a fuel cell are vertically aligned; the feeding manifold is formed in the upper part of the channels; and the discharge manifold is formed in the lower part of the channels.

10. The fuel cell as claimed in Claim 8, comprising a connecting channel inclined upward from the aperture connected with the feeding manifold to the feeding manifold.

11. The fuel cell as claimed in Claim 8, comprising a connecting channel inclined downward from the aperture connected with the discharge manifold to the feeding manifold.

12. A fuel cell comprising a fuel cell stack in which a plurality of cells for a fuel cell comprising electrodes and an electrolyte sandwiched between the electrodes are stacked via separators for a fuel cell, and an external manifold placed on a surface in the upper part of the fuel cell stack,

wherein a reaction fluid inlet in the fuel cell stack is placed above the contact surface between the surface in the upper part of the fuel cell stack and the external manifold.

13. The fuel cell as claimed in Claim 12, wherein the surface above the fuel cell stack has a width larger than that of the contact surface, and a condensed-water

collection area is provided between a surface where the reaction fluid inlet is placed and the contact surface.

14. The fuel cell as claimed in Claim 12, wherein the external manifold has a drain, above which the reaction fluid inlet of the fuel cell stack is placed.

15. The fuel cell as claimed in Claim 12, wherein the cross section perpendicular to the stacking direction of the fuel cell stack is substantially H-shaped.

16. The fuel cell as claimed in Claim 12, comprising a sealer for ensuring tightness between the surface above the fuel cell stack and the external manifold.

17. A separator for a fuel cell comprising a substrate; a rectangular channel-forming area in the substrate surface; a plurality of parallel channels formed along the longitudinal direction of the channel-forming area; and a reaction fluid feed port for feeding a reaction fluid in an external manifold, wherein the separator for a fuel cell is H-shaped.

18. A separator for a fuel cell comprising a substrate; a rectangular channel-forming area in the substrate surface; a plurality of parallel channels formed along the longitudinal direction of the

channel-forming area; and a reaction fluid feed port for feeding a reaction fluid in an external manifold, wherein the reaction fluid feed port is formed at the end of the substrate such that the port protrudes along the longitudinal direction of the substrate.

19. The separator for a fuel cell as claimed in Claim 17, wherein the substrate surface comprises a bead for preventing a reaction fluid fed from the reaction fluid feed port from leaking to the outside of the channel.

20. A separator for a fuel cell comprising a plurality of reaction fluid channels formed in parallel, said channels are within a rectangular area whose longitudinal direction is along the line connecting both ends of the channel, wherein there is a notch extending to the inside along the width direction at the center of the longitudinal length in an outer peripheral area of the rectangular area.

21. A fuel cell comprising, in the notch, a tie rod for combining and fastening a stack of the unit cells comprising the separators for a fuel cell as claimed in Claim 20 as a component with tie plates placed on both outermost surfaces of the stack for applying a compressive load in the stacking direction of the stack to fix the stack.

22. The fuel cell as claimed in Claim 21, wherein the notch comprises a collector plate for collecting electric power generated in the stack.

23. The fuel cell as claimed in Claim 21, wherein the notch comprises a voltage measuring terminal for the unit cell in the stack.

24. The fuel cell as claimed in Claim 21, wherein a rectangular heat insulating material is provided, covering the notch and the whole periphery of the stack.

25. A polymer electrolyte fuel cell comprising a separator having a plurality of channels through which an oxidizer and a fuel flow in the cathode and the anode sides, respectively and at the outlets of the channels, a concave header in which the channels are joined, where the reaction fluids from the channel are joined in the header and then enter a duct communicated with the outlet of the header and penetrating the cell in the stacking direction, wherein the apertures of the oxidizer channels or the fuel channels to the header have an opening area smaller than that in any of the other channel parts.

26. A polymer electrolyte fuel cell comprising a separator having a plurality of channels through which an oxidizer and a fuel flow in the cathode and the anode sides, respectively and at the outlets of the channels,

a concave header in which the channels are joined, where the reaction fluids from the channel are joined in the header and then enter a duct communicated with the outlet of the header and penetrating the cell in the stacking direction, wherein the header has a depth larger than that of the channels.

27. A polymer electrolyte fuel cell comprising a separator having a plurality of channels through which an oxidizer and a fuel flow in the cathode and the anode sides, respectively and at the outlets of the channels, a concave header in which the channels are joined, where the reaction fluids from the channel are joined in the header and then enter a duct communicated with the outlet of the header and penetrating the cell in the stacking direction, wherein the inner wall of the header is hydrophobic.

28. A polymer electrolyte fuel cell comprising a separator having a plurality of channels through which an oxidizer and a fuel flow in the cathode and the anode sides, respectively and at the outlets of the channels, a concave header in which the channels are joined, where the reaction fluids from the channel are joined in the header and then enter a duct communicated with the outlet of the header and penetrating the cell in the stacking direction, wherein a water absorber connected to the manifold is provided within the header.

29. The polymer electrolyte fuel cell as claimed in Claim 28, wherein the water absorber is in contact with the ends of the fluid channels.

30. A polymer electrolyte fuel cell, wherein the features in Claims 1 and 2 are combined.